



Fig. 1 Preoperative and postoperative radiological values. The values in centimeters of the maximum contralateral hemithorax length (x and x') were taken as references to quantify the changes in the operated hemithorax (y and y')

Table 1 Comparison of the percentage of patients who present symptoms between the preoperative stage and 3 postoperative months. Then patients at 3 months were compared with the postoperative 6, 12 and more than 30 month ones. Dyspnea = according to the “Medical Research Council” Scale, modified by the “American Thoracic Society”; Home support O₂ = Oxygen respiratory support at home. Figure in **boldface** (and underlined) show a percentage that is significantly different from its corresponding value for the symptom or when this value reaches 0%, so the test cannot be properly done (not underlined).

Symptom	Value	Preoperative	3 months	6 months	12 months	> 30 months
Dyspnoea	none	0%	61.1%	72.2%	72.2%	54.5%
	mild	5.6%	22.2%	22.2%	22.2%	45.5%
	moderate	16.7%	16.7%	5.6%	5.6%	0%
	serious	55.6%	0%	0%	0%	0%
	Very serious	22.2%	0%	0%	0%	0%
Orthopnoea	No	44.4%	100.0%	100.0%	100.0%	90.9%
	Yes	55.6%	0%	0%	0%	9.1%
Palpitation	No	100.0%	100.0%	100.0%	100.0%	100.0%
	Yes	0%	0%	0%	0%	0%
Dyspepsia	No	55.6%	88.9%	88.9%	100.0%	90.9%
	Yes	44.4%	11.1%	11.1%	0%	9.1%
Home support O ₂	No	66.7%	77.8%	88.9%	100.0%	90.9%
	Yes	33.3%	22.2%	11.1%	0%	9.1%

Methods: The model has been built from a physiological basis considering blood volumes in the different compartments as the model state variables. The relationships among different flows and blood pressures have been established by resistance functions of capacitance.

Results: The model has been proven by considering the classic Fontan procedure and the techniques from the lateral tunnel and the extracardiac conduit. The results have been validated with other authors' published data available in the literature, and with the knowledge provided by several cardiovascular surgeons with many years of experience in such interventions.

Conclusions: A useful tool, easy to use and low-cost, has been developed that allows the prediction of some hemodynamic variables associated to the univentricular heart.

CORRELATION STUDY BETWEEN MOTION ANALYSIS OF LAPAROSCOPIC INSTRUMENTS AND A SUTURING CHECKLIST

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Purpose: To compare assessment capabilities of a motion analysis tool against a validated checklist during laparoscopic training.

Methods: Construct and concurrent validation of the motion analysis tool were sought. Performance on a suturing task was rated by two experienced surgeons using a suturing checklist. Spearman's correlation between both methods was analysed.

Results: 18 novices, 15 intermediates and 11 experts (< 10; 11–100; > 100 laparoscopic surgeries respectively) participated in this study. Inter-examiner reliability was 0.974. There were no statistically significant differences between intermediate and expert groups regarding checklist score ($p < 0.05$). Time and path length (non-dominant hand) showed statistically significant differences between the three groups. Parameters rated by the checklist related to time and

path length, showing a strong correlation with needle position. Needle position and driving also related to economy of area and economy of volume.

Conclusions: There is a correlation between checklist score and the tool's motion analysis metrics.

CHANGING THE PARADIGM: ENDOSCOPIC VIDEO ANALYSIS AND INFORMATION EXTRACTION FOR SAFER SURGERIES

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Background: Minimally invasive surgery creates two technological opportunities: (1) the development of better training and objective evaluation environments, and (2) the creation of image guided surgical systems.

Methods: Surgical video processing algorithms have been developed and validated to provide useful information about the surgical scenes and with the following goals: (1) segmentation and tracking of structures, (2) 3D reconstruction for the acquisition of the depth map of the surgical scene and (3) trocars and endoscope 3D tracking.

Results: Video analysis algorithms have led to the development of three environments focused on (1) cognitive skills' training (TELMA environment), (2) objective assessment (EVA tracking system) and (3) soft-tissue surgical navigation (THEMIS liver image and video navigation environment).

Conclusions: Video processing is presented as a solution to obtain useful surgical information allowing the localization and tracking of the elements and the 3D reconstruction of the anatomical scenario, in a non-intrusive way during the procedure.

INTRAOPERATIVE IMAGING IN NEUROSURGERY: INITIAL EXPERIENCE WITH CT-SCAN IN DEEP BRAIN STIMULATION AND SPINE SURGERY

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Background: Intraoperative imaging technologies have an ever-increasing role in surgery. The O-Arm (Medtronic intraoperative CT-scan) provides multidimensional images suitable for the neuronavigation station. The effectiveness of deep brain stimulation (DBS) and spine surgery depends on the accuracy of the location of electrodes and osteosynthesis implants.

Methods: A 1-year prospective compilation of patients operated on with the use of O-Arm has been performed in Cruces University Hospital.

Results: DBS: we have operated on 13 patients. Patient positioning adjusted to the O-arm requires a learning curve. Hypothesis previously made by microelectrode recording is confirmed in most of the cases. It also has been useful for decision-making. Spine surgery: we have operated on 74 patients and issues that affect overall surgery time are related to system positioning, operating table or surgical instruments.

Conclusions: We report here our early experiences with the O-arm in spine surgery and DBS. In order to overcome initial difficulties a suitable training is essential.

ISOLATED TRICUSPID VALVE SURGERY WITH NORMOFUNCTIONING LEFT SIDE. THE END-STAGE RHEUMATIC HEART VALVE DISEASE

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Background: The aim of this study was to compare early and long-term results in patients who underwent either isolated repair or replacement of the tricuspid valve with normofunctioning left side valves.

Methods: Forty-seven patients underwent tricuspid valve replacement (TVR) (n = 29, 61.7%) or repair (TVr) (n = 18, 38.3%). Patients undergoing TVR had the same tricuspid regurgitation (TR) degree: 3.57 versus 3.55.

Results: Hospital mortality was 8 patients (17.0%) and was higher among patients of the TVR group (27.6%) than in TVr group (0.0%) (p = .01). Actuarial survival curve was 30.7 ± 9.4% at 10 years and null at 20 years for TVR group. For TVr group, actuarial survival curve was 58.6 ± 12.1% at 10 years and 32.6 ± 15.3% at 20 years. Comparison between both groups shows statistical significant differences (p = 0.011).

Conclusions: Patients who required an isolated tricuspid valve surgery with normofunctioning left side valves have a significantly high early and long-term mortality due to cardiac and valvular causes. This bad prognosis is even worse for those patients who required a tricuspid valve replacement comparing with those who underwent a valve repair.

MITRAL AND TRICUSPID VALVE REPAIR WITH DURAN FLEXIBLE RING ANNULOPLASTY

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Objectives: We examined predictors of early and very long-term outcome after combined mitral and tricuspid valve repair with a flexible ring for rheumatic disease.

Methods: Between 1974 and 1999, 122 consecutive patients (mean age, 45.1 ± 12.5 years) underwent combined mitral and tricuspid valve annuloplasty with a flexible ring. Mitral repair included commissurotomy associated with a flexible annuloplasty in 98 (80.3%), and isolated flexible annuloplasty in 24 (19.7%). Tricuspid valve repair included flexible annuloplasty in 44 patients (36.1%) and annuloplasty combined with tricuspid commissurotomy in 78 patients (63.9%).

Results: Thirty-day mortality was 4.8%. Predictors of early mortality were previous mitral closed commissurotomy, postclamping time and reoperation for bleeding. Late mortality was 94 patients (77.1%) and the main cause was cardiac failure. Forty-six (37.7%) patients required valve reoperation, and 31 of them (67.4%) had been for progression of rheumatic valvular disease.

Conclusions: Combined mitral and tricuspid valve repair with a flexible ring in rheumatic disease showed satisfactory early results. Long-term results were poor because of high mortality and a high number of valve-related reoperations. The use of prosthetic ring annuloplasty was associated with a reduced incidence of both mitral and tricuspid valve reoperations.

EVALUATION OF POSTOPERATIVE LUNG FUNCTION AND THORACIC PAIN IN PATIENTS WITH DIFFERENT METHODS OF STERNAL CLOSURE

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Purpose: Comparing results of postoperative pain and ventilation parameters in patients undergoing sternal closure with nitinol clips versus patients with classic steelwire suture.

Methods: 140 heart surgery patients were randomized in groups performing sternal closure by steel wires suture or by nitinol clips. Both groups were comparable for sternal dehiscence risk. Spirometry and diffusion tests were performed pre and early postoperative and studied by means of pre/postoperative decremental percentages. Postoperative thoracic pain was also evaluated (absent = 0, maximum = 5).

Results: Deceased patients (n = 7) and prolonged mechanical ventilation and mediastinitis cases were excluded. Pain evaluation was better in nitinol group (2.5 ± 0.8) than wires group (3.7 ± 1.8). Both inspiratory and total lung capacities decrease less in group 1 than in group 0. Neither FEV1 nor diffusion test showed differences between groups.